

WJ 8617B and 8618B 10 KHz IF Bandwidth Upgrade

By: Stephen Pappin

Many early 8617Bs and 8618Bs were configured with 20 KHz IF filters in bandwidth position 1. This bandwidth is suitable for A9W Composite Emissions but not for A3E or F3E Emissions. A 10 KHz band width is useful for FM land mobile reception or as a roofing filter for SSB operation. It is possible to field upgrade the radios for use with narrower filters. The 8617B / 8618B 10 KHz upgrade is fairly straight forward. Two methods of upgrade are explained, a simple board swap and modifications to the existing boards.

Board Swap: The board swap requires replacing the 20 KHz boards and the associated front panel BW key with 10 KHz hardware. The board swap **DOES NOT REQUIRE** alignment.

Modification: Modification of the original 20 KHz boards **REQUIRES** re-alignment of the associated boards. It does not require a complete re-alignment of the receiver. Manuals, tools, and test equipment should be obtained prior to performing any work. **THE MANUAL IS REQUIRED.** Do not attempt this modification without it!

This procedure focuses on the modification of 20 KHz IF Amplifier and FM Demodulator boards.

Materials Required

Board Swap: Replace the 20 KHz boards, 724006-2, 794106-2, and 20 KHz BW key. Install:

724006-1, 10 KHz IF Amplifier board (A3A17 on page 4)

794106-1, 10 KHz FM Demodulator board (A3A9 on page 5)

10 KHz front panel push button BW key (pry the 20 KHz key off with a plastic non marking tool)

Modification: Modify an Existing 20 KHz board set

Recommended and required materials

Manual: WJ-8617B or WJ-8618B manual 1984 edition - required

De Soldering Tool: 100W de-soldering tool with proper tips

Extender Cards: Desirable - not required

Manual Pages: (see the attached pages for manual figures and numbers)

Test Equipment: Please consult the alignment procedures in the manual - required

a. 724006-2, 20 KHz IF Amplifier board (A3A9 on page 4)

FL1: 92001, 10 KHz Crystal Filter, 3:1 shape factor

R18: CF1/4-100 OHMS/J, 100 Ohm resistor, ¼ W, metal film resistor

R20: CF1/4-3.3K/J, 3.3K Ohm resistor, ¼ W, metal film resistor

b. 794106-2, 20 KHz FM Demodulator board (A3A17 on page 5)

L4: 553-3635-53, 22mH inductor

L5: 553-3635-51, 15mH inductor

C6: 301-000U2J0-150J, 15pF silver mica or ceramic capacitor

C17: CK06BX683K, 0.068uF film or molded ceramic capacitor

R2: RN55C2371F, 2.37K Ohm, 1/10 W, metal film resistor

R3: RN55C1371F, 1.37K Ohm, 1/10 W, metal film resistor

c. 10 KHz front panel push button BW key

Upgrades

Board Swap: No additional work is required. Turn on the radio and verify operation.

Modification: A vacuum de-soldering tool with adjustable heat ranges is highly recommended for component removal. Be careful, work slowly, and avoid damaging the PC boards. On large ground planes a hot air leveling tool can be used to re flow solder to regain the original factory look. Verify your modifications prior to clean up. Alignment will be required before performance tests can be run.

a. 724006-2, 20 KHz IF Amplifier board (A3A9 on page 4)

Remove R11

Replace R18 with a 100 Ohm resistor

Replace R20 with a 3.3K Ohm resistor

Replace the 20 KHz filter can p/n 92002 with the 10 KHz filter can p/n 92001

Change the board designation to -1

b. 794106-2, 20 KHz FM Demodulator board (A3A17 on page 5)

Replace L4 with a 22mH inductor

Replace L5 with a 15mH inductor

Replace C6 with a silver mica or ceramic capacitor

Replace C17 with a 0.068uF film or molded ceramic capacitor

Replace R2 with a 2.37K Ohm, 1/10 W, metal film resistor

Replace R3 with a 1.37K Ohm, 1/10 W, metal film resistor

Change the board designation to -1

c. Install the 10 KHz front panel BW key in position one

Alignment

The 8617B / 8618B Manual defines the required equipment and procedures for alignment.

Please refer to the following pages in the 8617B / 8618B manual:

a. Page 4-44, IF Amplifier (A3A9 through A3A13) Alignment

b. Page 4-50, FM Demodulator (A3A17 through A3A21) Alignment

The alignment can be performed without using extender cards, but it is much easier to perform with extender cards. To align the boards without using extender cards simply remove all of the boards to the right of the card you are working on. This allows enough room for flexible nylon tools to be used to make adjustments.

Notes:

- a. IF Amplifier BW Code: On the work bench use a lab power supply to preset the new boards BW code voltage to 1.0V. Install the 10 KHz IF Amplifier board in position one.
- b. Without Extenders (as seen from the front of the receiver): Remove all boards to the right of the boards being aligned. The 10 KHz boards should be installed in the far left positions.
- c. Install 1" spacers under the receiver and remove the top cover to allow convection cooling.
- d. Allow the receiver to warm up for several hours prior to attempting alignment

After you are finished, run the performance tests on pages 4-7 and 4-8. Check AGC performance, page 4-9. If the signal strength readings are incorrect perform the AGC alignment on page 4-53.

Suggestions and Comments

Work slowly and carefully. Do not damage the PC board by overheating or prying. Use a commercial de-soldering tool rated at 100W. Remove excess solder using wick or braid if necessary. Use a hot air leveling tool to reflow solder on large ground planes.

Read the applicable sections in the manual prior to performing this upgrade.

724006 21.4 MHz IF Amplifier Board showing R11, R18, R20, and FL1

FIGURE 5-19

WJ-8618B

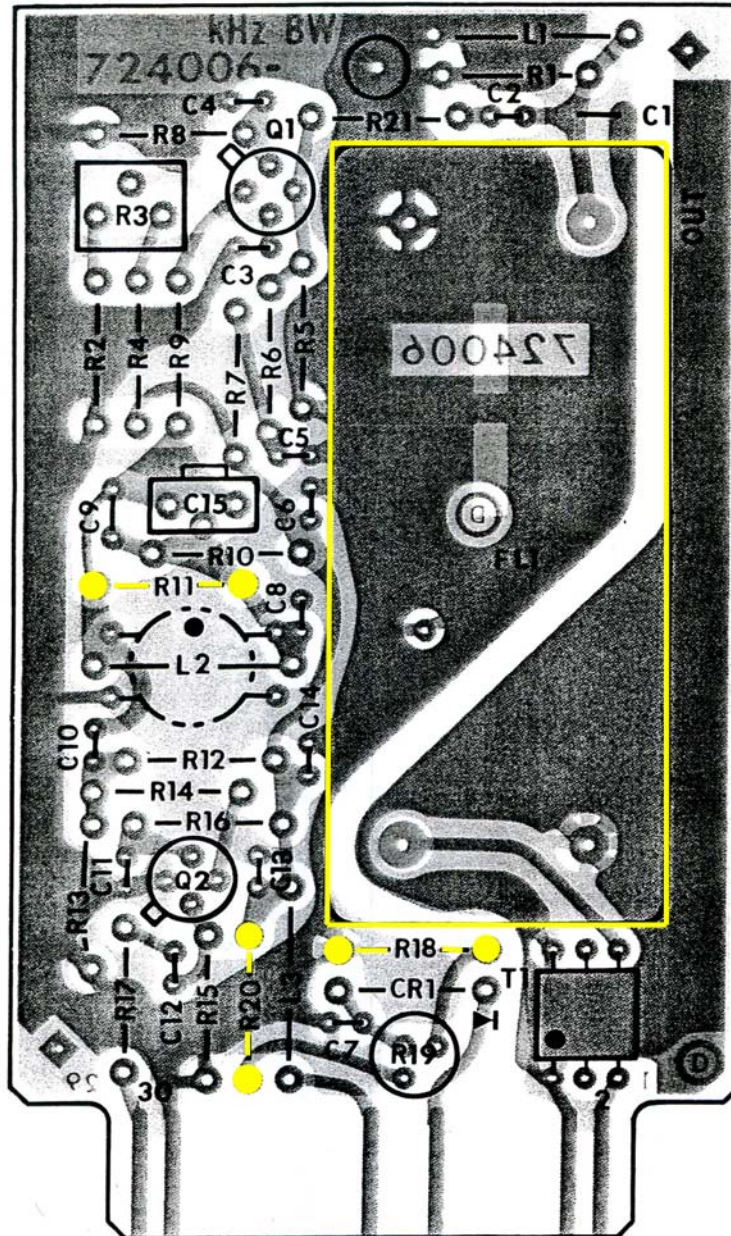


Figure 5-19. Type 724006 21.4 MHz IF Amplifier (A3A9-A3A13), Location of Components

794106 FM Demodulator Board showing R2, R3, C6, C17, L4, and L5

FIGURE 5-26

WJ-8618B

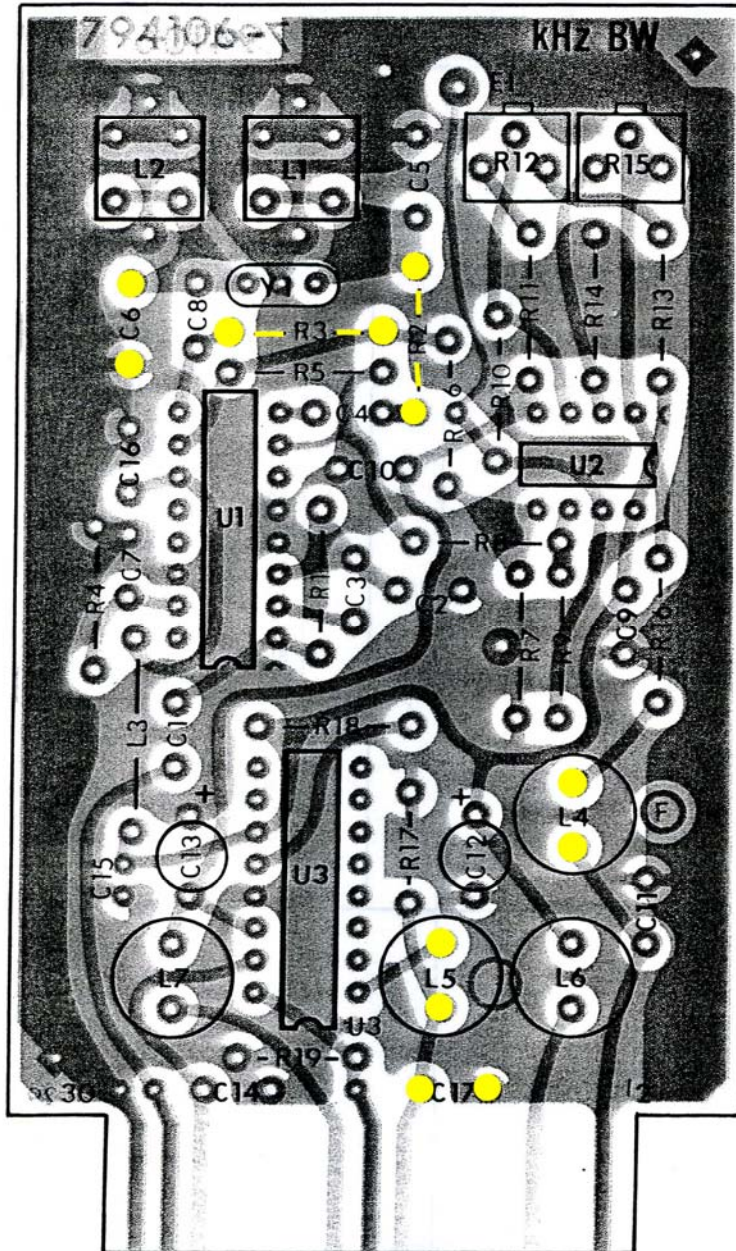


Figure 5-26. Type 794106 FM Demodulator (A3A17-A3A21), Location of Components